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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • DECEMBER 25, 1943



Christmas Flowers

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A SCIENCE SERVICE PUBLICATION

ASTRONOMY

Eclipse Expedition

Group of leading Mexican astronomers is on way to Peru to observe the total eclipse of the sun occurring on Jan. 25. This is the only known expedition.

► AN EXPEDITION of leading Mexican astronomers will observe the total eclipse of the sun on Jan. 25 from Peru, and the party is now en route to that South American country on board a Mexican warship.

Headed by Dr. Joaquin Gallo, director of the Mexican National Observatory at Tacubaya, the group also includes Dr. Luis Enrique Erro and Dr. Carlos Graeff Fernandez, director and assistant director of the newly established Astrophysical Observatory at Tonanzintla, in the state of Puebla.

Both observatories have provided instruments and equipment, which includes modern eclipse cameras and spectrographs.

The eclipse expedition has the joint sponsorship of the Mexican federal government, the state of Puebla and the University of Mexico. The initiative for the expedition came from Dr. Gonzalo Bautista, governor of Puebla, who has also sponsored the Tonanzintla Obser-

vatory, which has had the cooperation of Harvard Observatory. President Avila Camacho has aided the plans on behalf of the federal government and Ambassador Luis Fernan Cisneros of Peru promised a welcome from that country to the Mexican astronomers.

The astronomers expect to set up their instruments at Cajamarca in Peru, well within the narrow path of total darkness created by the moon coming between the sun and the earth.

The voyage to Peru from an unannounced Mexican port will be a training cruise for Mexican midshipmen as well as an astronomical trip.

Because of war conditions it is expected that otherwise the Jan. 25 eclipse, whose totality extends across South America through Brazil and Peru, will be poorly observed. So far as known, there will be no eclipse expeditions from the United States.

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MEDICINE

Damaged Liver Glued

New method, employing sticky substance made from blood plasma and cell extract, avoids bleeding which is common when parts are stitched together.

► A NEW METHOD for treating war wounds in which the liver or spleen is ruptured has been developed by Dr. Machteld E. Sano and Dr. Clarence A. Holland, of Temple University.

Instead of stitching the torn or cut edges of the liver together, these surgeons stick them together with a kind of natural glue made of blood plasma and cell extract. (*Science*, Dec. 10)

The method was originally developed for making skin grafts stick and grow fast to the underlying tissues. Adaptation of the method to treatment of ruptured liver or spleen was made at the suggestion of Dr. W. Wayne Babcock, professor of surgery at Temple.

Formerly the cut edges of a ruptured liver were sewn together, which fre-

quently promoted, rather than controlled bleeding. Another method, packing the injured part of the liver with gauze instead of sewing it to control bleeding, is also often complicated by bleeding when the pack is removed.

The new method is said to present none of these difficulties, making use of the physiologic principles of blood clotting and wound healing. The method is also extremely simple. The plasma and cell extract mixture is rapidly brushed over the bleeding surfaces of the liver which are to be joined. A sterile camel-hair brush is used. The two surfaces are then held firmly together for about three minutes, after which they will stick firmly to each other without being held.

Damaged liver surfaces will sometimes

stick together after being pressed against each other even without the plasma mixture. The Temple University scientists, however, found in trials on 15 dog livers and one human liver that adhesion was 100% when the plasma and cell extract mixture was used, but in one-fifth of the cases (20%) the liver had to be restuck when the mixture was not used.

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POPULATION

Jap-Population Program Meeting Serious Setbacks

► JAPAN'S recently adopted population program calling for a population increase of 27,000,000 by 1960 to bring the anticipated total in Japan to 100,000,000 is meeting serious setbacks due to the war, Dr. Jesse F. Steiner of the University of Washington has reported to the American Sociological Society.

The Japanese government, which has announced that it is prepared to sacrifice 10,000,000 men in order to defeat the enemy, is at this time, Dr. Steiner stated, faced with a rising death rate both on the home front and war front, as well as a declining birth rate due to the war.

Factors contributing to a declining birth rate, he said, are the hundreds of thousands of Japanese soldiers stationed in remote places and unable to get home and the increasing number of soldiers' widows, who in accordance with long-established custom will not be likely to marry again.

Therefore, Dr. Steiner stated, it would seem safe to conclude that Japan's period of swarming has definitely ended and may be succeeded by a period of actual population decline in the near future.

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ENGINEERING

Portable Germ-Killing Air-Conditioner Invented

► A PORTABLE air-conditioning apparatus, in which germ-killing ultraviolet lamps are added to cooling elements for summer use and heating coils for use in winter, is the invention on which Joseph B. Grison of Braintree, Mass., has been granted patent No. 2,335,056. There are also arrangements for deodorizing the air and adding perfume if desired, and a fan to draw air through the apparatus. The whole set-up is housed in a compact wheeled cabinet.

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MEDICINE

Hope for Leprosy Remedy

Beneficial effects of promin treatment give specialists renewed expectations that they may be able to conquer the disease by chemotherapy.

► NEW HOPE for the conquest of leprosy by a chemical remedy appears in a report of beneficial results from promin treatment of leprosy at the U. S. Marine Hospital (National Leprosarium) in Carville, La.

Promin "can be regarded as the most encouraging experimental treatment ever undertaken at the National Leprosarium," Dr. G. H. Faget and associates declare in *Public Health Reports* (Nov. 26), official publication of the U. S. Public Health Service.

Promin is a chemical relative of the sulfa drugs. It has been remarkably successful in combatting experimental tuberculosis in guinea pigs and showed promise in human tuberculosis.

Trial of it in leprosy was started over two years ago. It is not considered a specific cure for leprosy, no case as yet having become arrested under its influence. The progress of the disease, however, has been checked in a considerable percentage of cases. Dr. Faget and associates believe it is an advance in the right direction and that further research may lead to synthesis of a sulfa drug that will succeed "in saving countless lives" threatened by leprosy and other diseases, such as tuberculosis, caused by mycobacteria.

The drug proved too toxic to be given by mouth, but with suitable precautions could be safely given by injection into the patient's veins. It was given daily except Sunday for months, with rest intervals of one to two weeks three times a year. Some patients who showed allergic skin reaction were successfully desensitized to promin and could then continue the treatment.

Eye complications of leprosy, leprosy laryngitis, sores of lips, tongue, gums and palate, and ulcers of the nasal mucous membranes all showed improvement under treatment. One patient who had had leprosy for 12 years improved so much that he was able to play baseball for the first time in three years.

Another drug closely related to promin and which could be given by mouth was also tried and found to check the course of the disease. The beneficial results with both drugs were not, the sci-

entists believed, due to spontaneous remissions in the course of the disease.

Associated with Dr. Faget in the trial of promin were: Dr. R. C. Pogge, Dr. F. A. Johansen, Dr. J. F. Dinan, Dr. B. M. Prejean and Dr. C. G. Eccles, all officers of the U. S. Public Health Service on the staff of the National Leprosarium.

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PUBLIC HEALTH

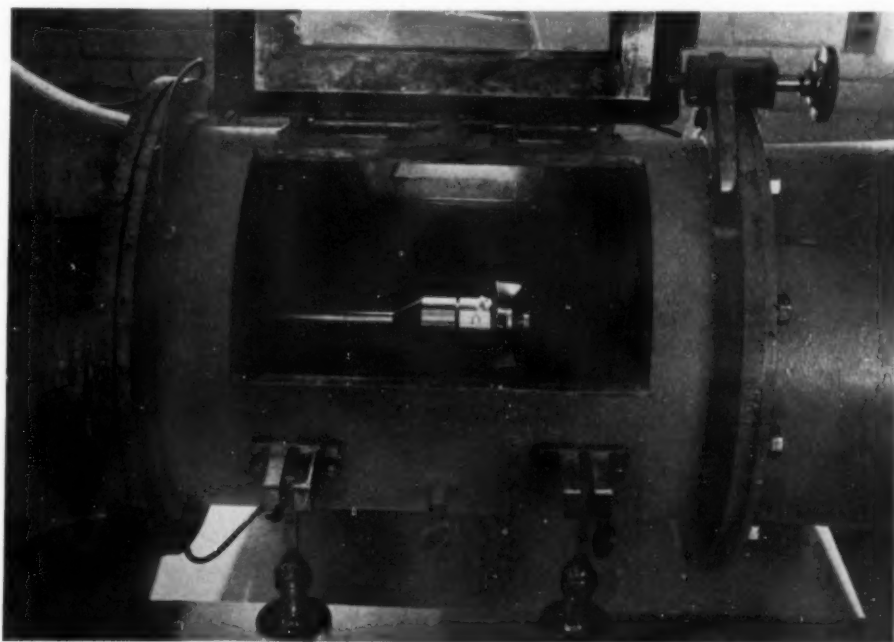
Home-Canned Foods May Harbor Dangerous Germs

► REPORT that two persons in New York State have died from botulism acquired by eating home-canned egg plant that was not properly prepared should serve as a reminder that a similar dan-

ger may threaten you and your family. Home-canned fruits, meat and fish may harbor the dangerous germs of this disease as well as canned vegetables, unless the canning was done in such a way as to kill not only the germs but their spores.

If you have the slightest doubt about the safety of any home-canned food, boil it for 15 minutes before you even taste it, much less serve it. This 15-minute boiling will destroy the poison produced by the botulinus organism. Count the boiling time from when boiling, not just simmering, actually starts, that is when bubbles are breaking at the top. The food should also be stirred frequently during the boiling so that all parts get the heat.

The sickness may start as soon as two to four hours after eating the poisoned food, but usually does not begin until some 12 to 36 hours have elapsed. The earliest symptom in most cases is a peculiar lassitude or tired feeling, sometimes with headache and dizziness. This may be attributed to constipation, another usually early symptom of the poisoning. Some patients first have an acute digestive upset, with a burning feel-



TESTING BLOCKBUSTERS—A bomb fuze is shown in place for testing in one of the highest speed wind tunnels in the world, located at Dover, N. J. Bomb parts can be tested in artificial gales of over 700 miles an hour. Pieces of the bomb parts which may rip off are driven into a recovery room where they are examined. An unusual feature of the equipment is that it is possible to read directly the wind speed in miles per hour. A furnace on the site of Picatinny Arsenal, which houses the new wind tunnel, turned out solid iron shot for George Washington's Continental Army.

ing in the abdomen, nausea, vomiting and diarrhea.

The characteristic symptoms of botulism, however, are those showing disturbance of the central nervous system. Among these are double vision, drooping of the upper eyelids from paralysis and dilated pupils. Soon the patient will have trouble in swallowing and talking. There is usually no fever. Even though

the patient may be unable to talk, his mind usually is clear up to a short time before he dies and he can often write his wishes or needs.

Death usually comes from failure of the breathing apparatus and usually occurs within three to six days after eating the poisoned food. Some patients do recover.

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MEDICINE

Penicillin Helps Wounds

Reports from Army hospitals show 164 out of 209 patients improved. Mold chemical fails to have beneficial effects against malaria.

► **RESULTS** of penicillin treatment of infected wounds in U. S. Army hospitals in the United States where the potent germ-killer from mold has been used since April 1, 1943, are summarized in a report by Major Champ Lyons, M.C., A.U.S. (*Journal, American Medical Association*, Dec. 18)

Of 209 patients treated, 164 improved, 13 died and in 32 the treatment had no effect.

Hope that penicillin might prove a potent weapon against malaria is not borne out by the report. The mold chemical failed in four cases of malaria due to *Plasmodium vivax*, and two other patients developed recurrent malaria under treatment.

Penicillin can produce "dramatically successful" results in treating septic gunshot fractures but, Major Lyons emphasized, its position is supplemental in the overall surgical program. To get these dramatically successful results, the surgeon must combine penicillin with effective blood transfusions and conservative surgical procedures according to the condition of each patient.

Important advantage of penicillin is that it helps fight anemia in chronically infected battle casualties. Part of this seems to be due to the increased appetite the patient develops while under penicillin treatment, enabling him to eat more blood-building food, and part to the fact that penicillin controls the infection.

This regeneration of hemoglobin, the blood's red coloring matter, proceeds too slowly under penicillin treatment alone, however, in view of the need to economize on penicillin and to reduce the time the patient must spend in the hospital. Consequently blood transfusions must be resorted to. Whole blood is best for this and the quantities needed for each patient are estimated at from one and one-half to three quarts.

The results reported by Major Lyons cover experiences with penicillin in 11 Army hospitals where every detail of the treatment was studied with great care so that as much as possible might be learned about the drug, effective doses, conditions that would be helped and those that would not, and the like.

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PUBLIC HEALTH

Weather Won't Check Flu

► **THE** POPULAR notion that the present cold weather over most of the country will check the influenza epidemic might well be called "wishful thinking," for there does not seem to be any scientific evidence to support it. Nor is there any reason to suppose that milder weather will affect the course of the epidemic.

During the 1918 pandemic, influenza

was prevalent at about the same time in such widely separated regions as the United States, Brazil, India, South Africa and New Zealand. This "is sufficient to prove a high degree of independence of the weather," wrote the late Edwin O. Jordan, University of Chicago professor who made an exhaustive study of the 1918 pandemic.

Fine autumn weather prevailed in

many of the Army camps in September and October, 1918, during the very days when the number of influenza cases was shooting rapidly toward the peak, he pointed out.

While weather conditions seem to have little if any effect on influenza itself, they may influence liability to and gravity of complications caused by germs that invade in the wake of the influenza virus, this same authority stated.

Further evidence of how little the weather affects influenza is seen in mortality figures he cited. These showed

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that during a period when some cities and towns were almost overwhelmed by the epidemic, with high death rates, other communities no more than 20 miles away had few cases and needed no help.

Cold or wet weather that keeps peo-

ple at home might lessen their chances of catching influenza from outside sources but might, another authority points out, increase the chances of the disease sweeping through the family if one member were attacked.

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PUBLIC HEALTH

What To Do for Flu

Six important things everyone should know about influenza include the fact that it is caused by a virus, that patients should stay in bed.

► IF an influenza outbreak occurs in your community, here are some things you need to know about the disease:

1. It is caused by the kind of ultra-microscopic germ called a virus. Viruses, with about one exception, are not susceptible to attack by any of the sulfa drugs, though your doctor may give you a sulfa drug to take care of any other germs that follow the influenza virus invasion of your body. Efforts to develop a vaccine against the influenza virus have not yet proved completely successful.

2. The viruses of influenza (there are two known and one or more unknown influenza viruses) are spread on the nose and throat discharges and breath droplets from the influenza patients. If you keep out of crowds, you are less likely to pick up the virus from influenza patients who are still up and about instead of being home in bed.

3. Influenza in the past has very often been followed by pneumonia. It is important, therefore, to call a doctor, especially if you have a severe attack of influenza, so that treatment will be started promptly for the pneumonia if that is developing.

4. Influenza patients should stay in bed. Usually they feel too sick to want to be up, but it is not good sense to "keep going till you drop." By staying in bed you avoid drafts, pneumonia and other germs to which you are easy prey during an influenza attack; you conserve strength for fighting the influenza virus, and you avoid giving the disease to others. This last is a patriotic duty in wartime.

5. Your doctor will advise you about drinking plenty of water or other fluids, about diet, and will prescribe whatever medicines he thinks advisable to make you more comfortable. It is better not

to take any remedies except the ones your doctor orders.

6. Stay in bed as long as your doctor says you should, even though you feel perfectly well. The general rule is a full 24 hours in bed after the temperature is normal, if not longer.

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PUBLIC HEALTH

Mortality from Influenza 50% Above Last Year

► REPORTED cases of influenza rose throughout the nation during the week ending Dec. 11 to a total of 23,724, the U. S. Public Health Service announced. Previous week's total was 4,487, and the

five-year median for the same week in December is 2,742.

Seeking further information on the course of the epidemic, the Public Health Service has asked 40 large cities of the nation, with populations totalling about 27,000,000, to report weekly deaths from influenza and pneumonia combined. Replies from about half the cities received so far indicate that the influenza-pneumonia mortality is about 50% higher than for last year and about twice as high as the three-year average.

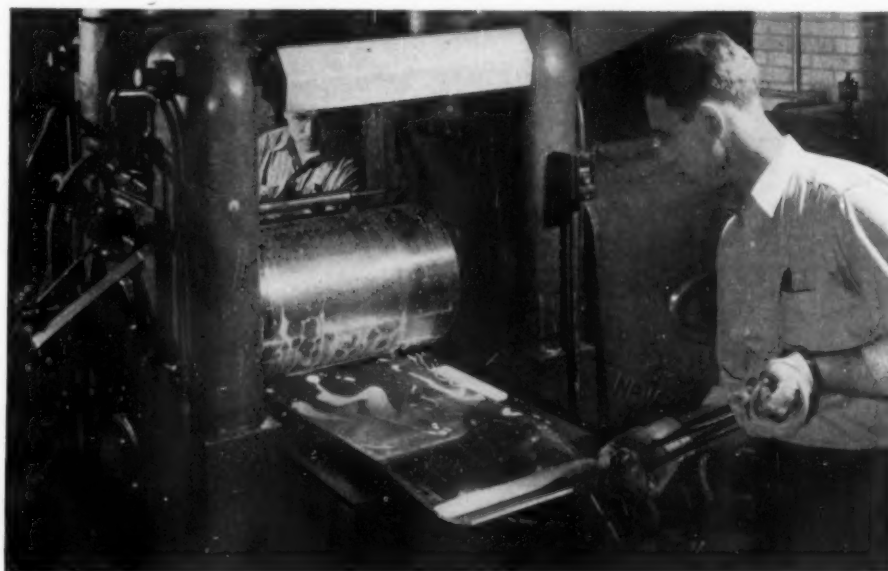
Most of the reports stated that the disease was of a mild type. From Detroit came a report of 10% to 15% absenteeism due to influenza. The health officer of Wilmington, Del., estimated about 6% of the population affected. Baltimore reported a city wide infection.

States reporting the largest number of cases were: Kentucky, 5,416; North Dakota, 4,331; Texas, 2,921; Iowa, 2,337; and Virginia, 1,649. No other states reported more than 1,000 cases for the week.

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Special color charts have been devised that enable the farmer to tell whether his *alfalfa* is healthy or not, and to diagnose the disease or insect pest that may be troubling it.

The high *explosives*, TNT, picric acid and tetryl, are made in whole or in part from bituminous coal.



EXPERIMENTAL ROLLING—An operator at the hot mill of the research laboratories of the Aluminum Company of America is shown rolling a test ingot of aluminum. The company is celebrating this month the twenty-fifth anniversary of the founding of the research laboratories.

ASTRONOMY

Moon Eclipses Sun

Shadow will move across the earth on Jan. 25. War conditions will prevent the usual thorough astronomical observations of the phenomenon.

By JAMES STOKLEY

► WAR will prevent observation of one of the most important astronomical events of January—which will occur on the 25th. On that day the shadow of the moon will sweep across the earth—in other words there will be a total eclipse of the sun.

The shadow will touch the earth in the Pacific Ocean near the equator, directly south of lower California, at sunrise, which will be about 9:45 a.m., EWT. Reaching South America, it crosses the town of Chiclayo on the coast of Peru. Then across inland Brazil, finally reaching the Atlantic Coast of that country at Fortaleza. Next, the speeding shadow crosses to Africa, racing and leaving behind any transport or military planes that may be making that crossing. Freetown, Liberia, is in the track. The shadow passes inland, leaving the earth as the sun is setting on the Tamgak mountains, in French West Africa. It will then be 2:04 p. m. EWT. That is, about 4 hours 20 minutes will be required for the shadow to make its journey of thousands of miles.

Path of Total Shadow

As the shadow traverses the earth, it traces a path of totality. In this path, a hundred miles or so in width, the moon will completely cover the sun. In interior Brazil, where the eclipse will last longest, the sun will be covered for four minutes, nine seconds, which is unusually long, though considerably short of the 7½ minutes which an eclipse theoretically can last—but seldom does.

If the world were now at peace, there would probably be a dozen expeditions from various countries scattered along the eclipse track, with cameras and spectroscopes set up, ready to observe the things that can best be observed at a total eclipse. So far as is known now, only one expedition to the track is planned. That is from Mexico, where there has been a great revival of astronomical interest in the last few years. Astronomers are taking two big cameras and a number of smaller ones to a point

in Peru. Probably some astronomers in South America will see it.

Certainly it should not go unobserved. Since this war started, scientists both in China and in Russia, despite the presence within their borders of invading armies, took time to make observations of other total eclipses of the sun.

To a person in the eclipse track, the sun will be completely covered by the dark disk of the moon, and the sun's pearly corona will appear around it, perhaps along with some prominences, the red flame-like protuberances that appear from the sun's edge. Though they can be detected at other times with proper instruments, it is only at a total eclipse of the sun that the corona and prominences can be seen with the naked eye.

Partial Eclipse Areas

Over a large part of western Africa, most of South America, Central America and the southern part of the United States from Texas to Florida, there will be a partial eclipse. The moon in these regions will just partly cover the sun. The nearer an observer is to the path of totality, the greater will be the amount of the sun that is hidden. A partial eclipse, however, is of slight interest scientifically, for only where the eclipse is total can the corona and prominences be seen, or other useful observations be made.

With the coming of January those distant stars which make up the constella-

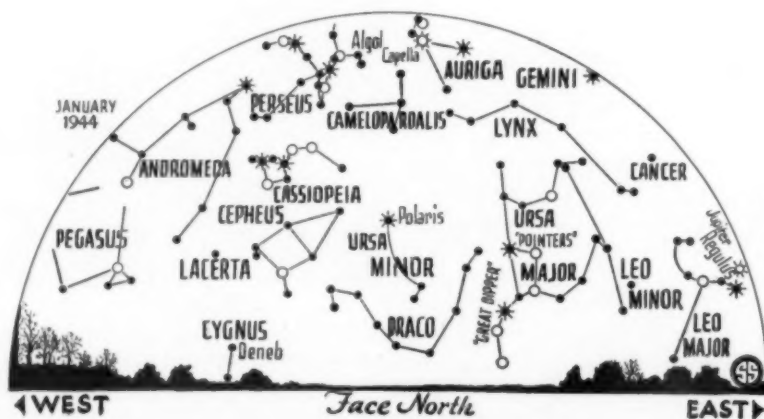
tions of Orion, Gemini, Canis Major, Taurus and their neighbors are seen in their full glory to the south in the evening. But January, 1944, will find this region even more brilliant than usual, for it has in it two bright planets—Mars and Saturn. In addition a third planet, Jupiter, which is even brighter, shines to the east close to another bright star.

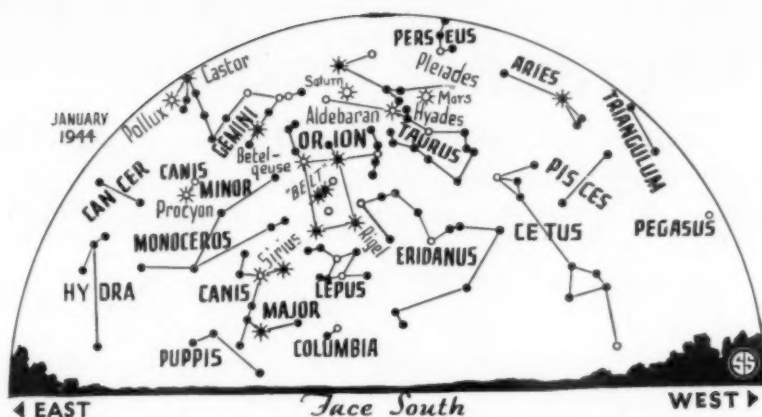
Look at Maps

Look at the accompanying maps. These depict the appearance of the heavens as seen at 11:00 p.m., your local war time, on Jan. 1, or at 10:00 p. m. in the middle of the month. In addition, of course, the moon swings across the heavens. It will be seen during most of the first half of the month, and the last few days as well. It always travels through the constellations of the zodiac, including Pisces, Aries, Taurus, Gemini, Cancer and Leo.

Of all the stars or planets indicated, Jupiter is the brightest, with magnitude minus 2 on the astronomical scale. Next in order of brightness is the star Sirius, the dog star, to the southeast in Canis Major, the great dog. Mars is next in order, then Saturn. Even through a telescope the stars appear as points of light, and their naked eye appearance, with the familiar "twinkling," makes them look very different from the planets, which have a more steady glow and shine by reflected sunlight.

Orion is a good group to locate first on these winter evenings, then from that you can find the rest. The three stars that form the warrior's belt are prominent in the south. Above them is Betelgeuse, and below is Rigel. A line from Sirius through the belt brings you close to Aldebaran, in





◊ * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Taurus, the bull, the group in which Saturn and Mars appear. Toward the southeast is Canis Minor, the lesser dog, with Procyon; while high in the east are Gemini, the twins, with Pollux, the brighter, and Castor. Low in the east just below Jupiter, is Regulus, in Leo, the lion.

Celestial Time Table for January

Jan.	EWT
2	4:04 p. m. Moon in first quarter.
3	12:54 a. m. Algol at minimum.
4	2:00 p. m. Earth nearest sun; distance 91,440,000 miles.

5	9:43 p. m. Algol at minimum.
6	5:22 p. m. Moon passes Mars.
7	11:47 p. m. Moon passes Saturn.
8	6:32 p. m. Algol at minimum.
10	6:09 a. m. Full moon.
11	3:21 p. m. Algol at minimum.
13	7:09 a. m. Moon passes Jupiter.
18	8:00 p. m. Moon farthest: 252,170 miles.
22	11:32 a. m. Moon in last quarter.
23	4:34 p. m. Moon passes Venus.
25	2:37 a. m. Algol at minimum.
26	11:24 a. m. New moon—Total eclipse of sun, visible in South America and South Africa.
28	11:26 p. m. Algol at minimum.
31	7:00 a. m. Moon nearest: 221,460 miles.
31	8:15 p. m. Algol at minimum.
31	3:00 p. m. Mercury farthest west of sun.
	5:04 p. m. Algol at minimum.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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ASTRONOMY

Stellar Timekeepers

► PULSATING stars known as Cepheid variables are among the best timekeepers in the world. Particularly regular in their pulsations are the short-period or cluster-type Cepheids, which go through a complete expansion and contraction in about one-half a day. Their changes in size are observed by us as variations in the positions of the lines in their spectra, which are also accompanied by fluctuations in the brightnesses of these stars.

So regular are such stars, for instance, the one known as AR Herculis, a tenth-magnitude star in the constellation of Hercules, that Everett C. Yowell, of Columbia University, has been able to determine its period as 11 hours, 16 minutes and 51 seconds. This information he derived from examining Harvard plates of the region of the sky containing this star and extending from 1899 to 1925. But on plates from the latter time to 1941, the period of the star is found to be 11 hours, 16 minutes, and 49.6

seconds, or 1.4 seconds shorter than formerly.

Together with a change in the rate of its primary fluctuations, this celestial timepiece has revised its "secondary" period as well, as Mr. Yowell finds that

this, too, has changed, increasing by about three seconds in 1925.

What happens inside such a star to make it so suddenly start beating a new rhythm is not known, but it must be explained by some real physical change. Meanwhile, astronomers are searching for other stars whose periods have changed unexpectedly.

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ZOOLOGY

Scientific Essay Contest Has Reptiles as Subject

► UNUSUAL knowledge of reptiles may win some scientist \$60 and possibly \$100 in the 1944 contest for the Dr. William Johnson Walker prizes offered annually by the Boston Society of Natural History.

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AGRICULTURE

New Machine Uniformly Plants, Waters Seedlings

► A MACHINE that undertakes to eliminate back-breaking "stoop labor" in the fields is a mechanical transplanter on which patent No. 2,333,945 was granted to A. D. Mast and L. A. Furlow of Lancaster, Pa. Large cartons of seedlings of such plants as tobacco, tomato and cabbage are placed in big, box-like magazines. Padded mechanical fingers remove them one by one and transfer them to a grooved wheel or disk that sets them into the soil at a uniform depth. At the same time, a regulated quantity of water is delivered from a reservoir.

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The United States used 9,000,000 tons of commercial fertilizers in 1941.

ERRATA, Vol. 44, Nos. 1-26, July-December, 1943

PAGE	TITLE BEGINS	CORRECTIONS
23	Study Enemy Weapons	Col. 2, line 2, July-August for June 30.
28	"Short"	Col. 3, line 1, after corn crop insert not including corn fed to livestock on the farm.
82	Do You Know	Par. 3, line 3, Cymbopogon for Cymbogon.
192	Philosophy	Col. 3, line 7, peck for peak.
198	Degreasers Cause Death	Par. 3, line 1, Some for The; lines 7-8, incoordinately for individually instead of together; line 13, after is insert sometimes.
249	TB Protection	Par. 4, line 5, she for he.
304	Identification Marks	Line 8, ultraviolet ray for X-ray.
308	Prehistoric Baths	Throughout article, Hernandez de Alba for de Alba.
341	Salt Taken from Water	Col. 3, lines 10-11 to read, the chemical and absorbed salts were retained by a.

Do You Know?

Soldiers in combat areas get two-thirds of their *food* from cans.

More than a million *earthworms* may live in one acre of good farm land.

Most of the *islands* of the Pacific are either volcanic cones or coral atolls.

Over 40% of Germany's *potato* crop, will be used this year to make power alcohol.

Booklets on the art of *make-up* are distributed to soldiers using cosmetics for camouflage.

The civilian *soap* supply for next year is expected to be 22 pounds per person, or five pounds more than for this year.

Five *coyotes*, recently captured in Texas, were responsible for killing 500 turkeys and 450 sheep during the past year.

Arsenic in various forms, alone or in combinations, has been long used satisfactorily as a wood preservative for poles and fence posts.

The Army Medical Corps uses a portable *X-ray* machine that can be assembled in six minutes and will locate foreign matter in a person in less than a minute.

Steam used in World War I to fumigate soldiers' *uniforms* left them wrinkled and often shrunken; methyl bromide fumes are used now and do not affect the clothes.

At the Western New York *egg-laying* contest just closed, a Rhode Island Red hen broke all previous records by laying 351 eggs in 357 days; the eggs weighed 48¼ pounds.

Low-grade *ores* containing copper, cobalt and gold in Lemhi County, Idaho, may soon be processed again because of newer flotation separation methods; over 200,000 tons of ore has been located.

The investment of the federal government in facilities for the conservation and use of western *water resources* amounts to \$870,000,000, covering huge dams, hundreds of miles of canals and electric power plants.

PUBLIC HEALTH

International Health

Post-war international cooperation in the health protection field is already well under way, according to statements of health directors of foreign countries.

► POST-WAR international cooperation is already getting under way in the field of health protection.

Signs of action along this line as well as intense desire for all nations to work together to protect the health of all people everywhere appeared in statements from the health directors of Great Britain, the Soviet Union, China, Egypt, Australia and seven Latin American countries to the wartime conference of the American Public Health Association in New York.

"The special problem of the present and the future is malaria and I can assure you that the Governments of our two peoples have completely interlocked their plans for dealing with this terrible menace," the Right Honorable Ernest Brown, Britain's Minister of Health, declared.

Large scale plans being made "by our Governments acting in concert" for post-war relief of peoples being freed of Nazi tyranny cited by Mr. Brown give further evidence that post-war international cooperation in health protection is reaching the action stage.

"Let the Pan-American ideal, the greatest of the ideals of America, be not alone a political and economic ideal, but be also an ideal of life and vigor," Mexico urged through Dr. Victor Fernandez Manero, director of the Department of Public Health.

"Just as we are fighting this war for global security, so we must work together for global health," Dr. Wei Tao-Ming, Chinese Ambassador to the United States, declared.

SOCIOLOGY

Cultural Lag May Come

► UNLESS a new social order is created after this war, we shall face a period in which cultural progress will be seriously diminished, or even arrested, Prof. Leslie A. White of the University of Michigan predicts. (*American Anthropologist*.)

Civilization has developed as man learned to make the energy of the sun work for him, Professor White explains.

This theme appeared also in the statement from Prof. Vladimir Lebedenko, representative of the Soviet Red Cross and Red Crescent of the U. S. S. R. who said, in part, that erasing "the horrible ravages of war" must be done "not by one people but by all together, in unity for the betterment of life and for the future of all mankind."

Dr. Guillermo Garcia de Paredes, Director of Health for Panama; Jules Thebaud, Director General of Haiti; Dr. Albert Recio, Director of Health and Social Welfare for Cuba, also urged greater international cooperation in health protection.

Science News Letter, December 25, 1943

New Three R's for Peace

► A NEW SET of three R's "essential to the complete achievement of our peace objectives" were introduced to the conference by Dr. Felix J. Underwood, Mississippi state health officer.

The new R's stand for restoration, rebuilding and rehabilitation. In planning for these objectives, Dr. Underwood said, public health leaders expect the individual citizen to have a larger share in their fulfillment.

"Motivated by a desire for permanent peace and a safe and pleasant place in which to live, he will surely assume an increasing amount of responsibility in putting to work the vast store of helpful knowledge on health practices which has evolved in recent years."

Science News Letter, December 25, 1943

cation of animals. The art of harnessing the energy of coal and oil in engines created the Power Age, the next great cultural advance.

Technological activity is stimulated or repressed by the existing social system, Professor White declares. Using the art of agriculture as an example, he points out that from 2000 B.C. to 1800 A.D. there was no fundamental improvement. The reason for such a cultural lag, even though the urge for security and efficiency was as great then as now, was that the social system obstructed technological advance, Professor White states.

To obtain more wealth, he explains, the ruling class merely increased taxes, rents or other levies upon the producers of wealth. If the masses produced more by increasing efficiency, it would only mean more for the tax-gatherers of the ruling class. Lack of incentive inherent

in the social system thus discouraged agricultural improvement for almost 4,000 years.

Professor White then discusses the inadequacy of our social system for our technological system: "At the present time our technology has outgrown our social system; the great forces of the Power Age are straining within the confines of institutions that were fashioned in stage coach days. The great wars of the Twentieth Century are expressions of this cultural conflict, and are chiefly significant for one reason: they are the means by which an old order is to be scrapped and a new one brought into being."

While not specifically describing social changes which may take place, Professor White predicts that they will be as profound and far-reaching as those effected by World War I, if not greater.

Science News Letter, December 25, 1943

MEDICINE

Vaccine Against TB

➤ INCREASED possibility of preventing tuberculosis by vaccination is seen in research by Dr. Truman Squire Potter, of the Laboratory of Preventive Medicine of the University of Chicago, according to an announcement from the University.

The vaccine which Dr. Potter believes will be effective, although it has not yet been tried on human beings, is made

from tuberculosis germs that are killed by suffocating them. Vaccines against tuberculosis have in the past been made either from living but weakened strains of the germs or from germs that were killed by heat or chemicals. None of these has been generally accepted as safe and effective, although promising results have been reported with B.C.G.

vaccine, made from living, attenuated tubercle bacilli.

The suffocation of the tuberculosis germs must be done under carefully controlled conditions which include an absence of oxygen, presence of moisture and a temperature high enough to keep the germs' metabolism active. Under these conditions, the germs die partly as a result of self-sabotage. By continuing their living processes they deprive themselves of oxygen as they breathe, and since no more is supplied them, they suffocate.

Destruction of the germs by this method, Dr. Potter believes, is less likely than other methods to reduce or destroy the tuberculosis antigen. Antigen stimulates the body's defensive mechanism so that, when vaccination is successful, the body defenses are ever on guard in suitable strength to overcome fresh invasion of the germs that produce the antigen. This is the principle of vaccination in general. In the case of tuberculosis, the problem has been to find a way of getting enough antigen into the body to develop immunity without giving so much or giving it in such form, for example in living germs, that it will cause tuberculosis.

In his latest research, reported to the Society for Experimental Biology and Medicine, Dr. Potter used a vaccine from asphyxiated human-type tuberculosis germs to protect rabbits. Of 33 vaccinated rabbits, only four showed minimal lesions of tuberculosis when large doses of virulent germs were injected into their veins after the vaccination. Of 33 unvaccinated rabbits, 25, including three that died, showed frequent severe lesions.

Science News Letter, December 25, 1943

BOTANY

Laymen Often Mistaken About Poinsettia Flowers

See Front Cover

➤ WHAT APPEAR to be three-horned, grotesque creatures in the picture taken by Fremont Davis on the cover of this SCIENCE NEWS LETTER are actually the true flowers of a poinsettia plant. These naked pistillate and staminate flowers are clustered near the center of the whorl of brightly colored leaves which are popularly considered to be the poinsettia flower. (See SNL, Dec. 18) The cup-shaped receptacle on which the flowers are situated secretes a sticky substance that tastes sweet.



CHRISTMAS PATTERN—The reason for the popular belief that the red leaves of the poinsettia plant compose its flower is clearly evidenced in this photograph, taken by Fremont Davis, Science Service staff photographer, at the United States Botanic Garden in Washington, D. C.

The leaves surrounding the real flowers develop a red pigment in place of the usual chlorophyll.

The "Mexican Flame Leaf," a native of Mexico and Central America, has a lesser known cousin in a variety with white bracts instead of red. There is also a double variety in which the colored leaves are branched.

Science News Letter, December 25, 1943

OPTICS

3-Dimensional Pictures Used to Teach Navigation

► TWO PICTURES, one superimposed on the other on a specially treated plastic sheet with the outlines seemingly not quite coinciding when viewed by the naked eye, do coincide when seen through special goggles, and stand out from the sheet as a single three-dimensional object. The three-dimensional picture is called a vectograph; the goggles are called polarizing three-dimensional viewers.

The three-dimensional vectograph can be thrown on a screen by any ordinary

projection apparatus, and viewed by a group of people simultaneously if each person is equipped with the polarizing three-dimensional viewers. These are small plastic pieces of specially prepared transparent material held in frames similar to ordinary eyeglasses.

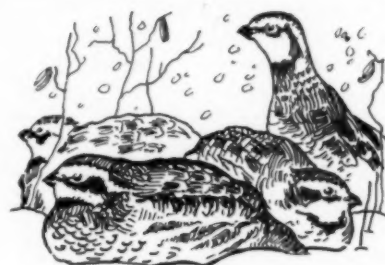
The new technique has recently been perfected by Prof. John T. Rule of the Massachusetts Institute of Technology, and is used by him in teaching aircraft navigation to military students. It eliminates the need for training men to interpret depth in flat charts by presenting life-like pictures of models of the heavens and the earth in three dimensions. Celestial navigation vectographs "teach students, easily, to see and think three-dimensionally," he states.

Formerly the only practical three-dimensional viewing device was the stereoscope. This, however, could be used by only one person at a time and was therefore of little use in a classroom. The vectograph process is the invention of Edwin H. Land and Joseph Mahler of the Polaroid Corporation.

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SPEEDS NAVIGATION TRAINING—MIT Prof. John T. Rule examines the globe which serves as a photographic model for three-dimensional pictures known as vectographs, which he uses in a new technique to teach military courses more easily and quickly. An instructor walking into the beam of a vectograph of this globe projected on a screen appears actually to be walking into the center of the earth itself.



Men of Good Will

★ "PEACE ON EARTH, good will towards men," is the version we commonly hear. A sentiment of grand, wide-hearted charity that takes in all mankind; so inclusive in its sweep, indeed, that few of us ever achieve the courage to believe in it and practice it fully.

Yet grand as it is, this expression limits itself. Strictly read, it offers good will only to human beings; that is, it is essentially simply a sociological ideal. It needs to be made, much more inclusive, to take in the whole of the living complex of which man's life is an inseparable part. That is, it needs to become in the widest sense an ecological ideal.

A better translation, from this point of view, may be found in St. Jerome's version, which renders into English as, "Peace on earth among men of good will."

That is a far less easy-going way of putting the idea; for it will be noted that it places upon all of us the obligation to become men of good will before we can expect peace. It should, incidentally, cause a good deal of heart-searching in these days when some proposed "peace" terms fairly drip with the most vindictive ill will toward the foes we expect to defeat.

But that is not the present theme, nor is it the whole crux of the building of ultimate peace. Whoever aspires to be *homo bonae voluntatis*, and so worthy of peace in his own heart, should examine his conscience well, to be sure that he is doing whatever lies in his power to end abuses of forests, grasslands, natural waters and the creatures that therein dwell, and to bring about legitimate and temperate uses of the

earth's bounties, distributed as equitably as possible among all men. Thus shall we achieve inner peace, and move toward peace within the state and among nations.

St. Francis of Assisi, who was a man of good will if the world ever saw one, understood this perhaps better than his biographers, contemporary or modern, have realized. His talks to birds and fishes and lone wandering wolves, his hailing of fire as brother and water as sister, were not mere pious sentimentalizing. By the swift intuition which often enables poets to arrive at natural truths without the labor of slow learning, he perceived the intimacy of man's relation as a creature to all other creatures, and so swept them all up into the wide embrace of his good will.

Science News Letter, December 25, 1943

INVENTION

Slot Machine Nickels Sorted by Conductivity

► "HOT" MONEY is good money when subjected to the test imposed by a device for slot machines on which Fred E. A. Wallin of University City, Mo., received patent No. 2,335,369. It makes the inserted nickel into part of a thermocouple, which passes more or less current according to the conductivity of the coin in contact with an electrically heated pin.

The nickel alloy in the American five-cent piece has very high conductivity, the almost pure nickel in the corresponding Canadian coin nearly as much. Slugs and spurious coins are far less conductive. Differences in volume of current passed determine whether the coin is accepted or shunted into the rejection chute. The machine can be set to accept both American and Canadian nickels, or American nickels only; in any case it turns down all imitations as being too "cold."

Science News Letter, December 25, 1943

ENGINEERING

Opportunities for Women Seen in Civil Engineering

► CIVIL engineering, which has to do with the construction of buildings, bridges, roads, etc., is a field women are not rushing into these war days. Yet Prof. Ray C. Brumfield of the Cooper Union Engineering School believes that there will be a serious shortage of such engineers in the future and that women are overlooking opportunities.

Science News Letter, December 25, 1943

Books Off the Press

CHEMICAL PROCESS PRINCIPLES: Part One; Material and Energy Balances—Olaf A. Hougen and Kenneth M. Watson—Wiley, 452 p., illus., \$4.50. A detailed discussion of procedures for estimating vapor pressures, critical constants, and heats of vaporization; new methods for dealing with equilibrium problems in extraction, adsorption, dissolution and crystallization.

COVERTS AND CASTS: Field Sports and Angling in Words and Pictures—William J. Schaldach—A. S. Barnes, 138 p., illus., \$5.

DEAFNESS AND THE DEAF IN THE UNITED STATES: Considered Primarily in Relation to Those Sometimes More or Less Erroneously Known as "Deaf-Mutes"—Harry Best—Macmillan, 675 p., \$6.50. A comprehensive authoritative book, including medical, organizational and educational aspects.

GEOMETRY: WITH MILITARY AND NAVAL APPLICATIONS—Willis F. Kern and James R. Bland—Wiley, 152 p., illus., \$1.75.

INDUSTRIAL CHEMISTRY—William Thornton Read—Wiley, 631 p., illus., \$5. This is a third edition of a successful text.

AN INTRODUCTION TO POLLEN ANALYSIS—G. Erdtman—Chronica Botanica, 239 p., illus., \$5.

MAINTENANCE ARC WELDING—A. F. Davis and Ed. C. Powers, eds. James F. Lincoln Arc Welding Found., 234 p., illus., 50c.

MODERN AIRFIELD: Planning and Concealment—Merrill E. De Longe—Pitman, 167 p., illus., \$4.

OIL INDUSTRY AND TRANSPORTATION: Prewar and Postwar—P. Harvey Middleton—Railway Business Assn., 60 p., 50c., paper.

PRINCIPLES AND PRACTICE OF REHABILITATION—John Eisele Davis—A. S. Barnes, 211 p., \$3.

THE RAFT BOOK: Lore Of The Sea And Sky—Harold Gatty—George Grady Press, 152 p., illus., \$3.25. With this book and enclosed charts, no instruments other than a stick and a piece of string, and no previous knowledge of navigation, persons who find themselves in small boats or rafts anywhere in any ocean or sea in the world can find their way to land.

STATISTICAL ABSTRACT OF THE UNITED STATES 1942—comp. by Morris H. Hansen—Gov. Print. Off., 1,097 p., \$1.75.

THE STORY OF PAINTING: From Cave Pictures to Modern Art—Thomas Craven—Simon and Schuster, 254 p., illus., \$5.

SYNTHETIC RESINS AND RUBBERS—Paul O. Powers—Wiley, 296 p., illus., \$3. The chemistry of synthetic resinous materials and the raw materials from which they are made. Covers: theories of polymer formation, condensation, polymers, vinyl polymers, synthetic rubbers, resins from natural products, application of synthetic resins.

THE TEN COMMANDMENTS: Ten Short Novels of Hitler's War Against the Moral Code—Armin L. Robinson, ed.—Simon and Schuster, 488 p., \$3. Fiction by a number of prominent authors.

TOMORROW WE FLY—William B. Stout and Franklin M. Reck—Crowell, 160 p., illus., \$2.

WORLD ECONOMICS—Lewis L. Lorwin, ed.—Institute of World Economics, 100 p., paper, Nos. 3-4. This issue with next volume, \$5.

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✿ A NEWLY patented electric fan has two sets of horizontal blades on the same shaft, set so that they will blow currents of air toward each other. Upward and downward currents, meeting half-way, deflect each other into a radial current, blowing horizontally in all directions.

Science News Letter, December 25, 1943

✿ BABIES may be washed, powdered and dressed with ease, it is claimed, with the use of a "safety holder for babies" recently patented. It is composed of a framed cot with center hinges. The wiggling baby is held by shoulder and leg straps. The hinges permit a lying or sitting position.

Science News Letter, December 25, 1943

✿ DRINKING GLASSES that look like ordinary glass tumblers are made from a heat-resistant resin molding powder. They are hard to break and are little affected by boiling in water. The same powder is used to make automobile and other lenses.

Science News Letter, December 25, 1943

✿ BENDING machines that shape accurately the miles of small hollow tubing



used daily in aircraft factories will make any bend or rotation within a half degree of accuracy. The simplicity of the machine is shown in the picture. The bending arm on the left has a pointer and a plate marked in degrees below.

Science News Letter, December 25, 1943

✿ SMALL BOATS may be propelled in narrow waters with a push-and-pull device now protected by a patent. A hinged, double-winged paddle on the end of a pole is set at right angles to the pole. When pushed, the wings open; when pulled, they close and offer little resistance to the water.

Science News Letter, December 25, 1943

✿ AIRPLANE wheels, tires and brakes are tested by a new machine. A tire is revolved against a 10-foot wheel which has a top speed of 200 miles an hour. Landing loads up to 40,000 pounds can be tested. Brakes are harnessed to the axle of the wheel for testing.

Science News Letter, December 25, 1943

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